ENVIRONMENTAL DEFENSE
finding the ways that work

Attachment 1: Description of Emissions Reduction Measure Form

Please fill out one form for each emission reduction measure. See instructions on attachment 2.

Title: Include industrial sources (e.g. general stationary combustion sources, semi-conductors and nitric acid manufacturing industrial facilities) in a multi-sector cap-and-trade program.

Type of Measure (check all that apply):

☐ Direct regulation
☐ Monetary Incentive
☐ Voluntary
☐ Other Describe:
☑ Market-based compliance:
☐ Non-monetary incentive
☐ Alternative Compliance Mechanism

Responsible Agency: California Air Resources Board

Sector:

☐ Transportation
☑ Other Industrial
☐ Agriculture
☐ Sequestration
☐ Electricity Generation
☐ Refineries
☐ Cement
☐ Other Describe:

2020 Baseline Emissions assumed (MMT CO2 eq): Unknown

Percent reduction in 2020:

See below

Cost effectiveness ($/metric ton CO2E) in 2020:

See below

Description:

Environmental Defense believes that emissions reductions from general stationary combustion sources should be achieved by inclusion in a multi-sector cap and trade program. Under a multi-sector cap and trade program, CARB would set a total allowable limit on emissions from all sectors that are within the cap. Regulated entities would then be required to submit allowances equal to their emissions during each compliance period. Therefore, since the overall cap would

be less than the current aggregate emissions, individual plants would be required to either reduce on-site emissions, purchase reductions from other capped facilities, or purchase qualified offsets.

Emissions from stationary combustion sources are likely to include a wide array of businesses in California. Such facilities will likely include paperboard and glass manufacturing, colleges and universities, oil producers, food and mineral processors, steel foundries, and malt beverage producers. These sources primarily combust natural gas for heat and steam production, though alternative liquid and gaseous fuels may also be used.

In 2007, the California Market Advisory committee recommended that combustion sources be covered under a multi-sector cap and trade program for emissions reductions. Within the analysis, the MAC used a low end cut-off rate for emissions of 10,000 metric tons of CO2. This emissions threshold is less than that proposed by CARB for inclusion in the mandatory reporting regulation and will likely include more source categories than those listed above.

Emission reduction calculations and assumptions:

Calculating the overall emissions reductions (cap): The emissions reductions required under a multi-sector cap and trade program are determined by the extent to which the cap is below the actual level of emissions in covered sectors. One of the best aspects of a cap is that it is a limit on the total allowable emissions from sources covered in the cap. Other regulatory approaches, such as performance-based standards, may limit emissions associated with a given activity, but do not limit the amount of activity and thus do not put a limit on total emissions. Furthermore, by observing allowance prices in the marketplace, the real costs of economy wide emissions mitigation can be observed and used to inform future adjustments to the cap. Similarly, the real costs of ratcheting the cap downward can be observed via changes in allowance prices.

We recommend a stringent multi-sector cap that is derived from an aggregation of sector-specific emissions reductions goals. CARB should also consider factors such as the size of the overall cap and trade market, the percentage of statewide greenhouse gas emissions that are under the cap, and the availability of offsets and linkages to beyond California in setting the cap. Ultimately, of course, the reductions required under the multi-sector cap and trade program, combined with reductions achieved through other measures, must equal or exceed the amount of reductions needed to reduce statewide greenhouse gas emissions to 1990 levels by 2020.

Estimating sector-specific emissions reductions: Several factors affect the calculation of an emissions reductions estimate for each sector. First, the number of emitting entities within each sector and cost curves for potential emissions reductions from that sector will help determine emissions reduction potential. Also, the contribution each sector makes to the overall California emissions inventory and cap-and-trade market is relevant. In addition, any sector-specific estimates rely, in part, on the historic emissions data for that sector. Further, the impact of other regulations applicable to each sector, along with cost and competitiveness factors unique to each sector, must also be assessed.

Cost effectiveness calculation and assumptions:

Economy wide cost effectiveness: There is a difference between a cost-effectiveness metric calculated as the costs per unit of emissions reduced and the idea of a program that is achieving reductions goals as least cost. Cap-and-trade policy ensures the latter. A cap and trade program creates incentives for emissions sources to find the least-cost options to achieve emission reductions. In a multi-sector cap and trade program, emissions sources have the option of pursuing on-site reduction strategies, purchasing emission allowances from other entities in any other sector under the cap that have been able to beat their own targets, or purchasing qualified offsets from entities not within the cap. This means that trading within and between sectors allows for market participants to seek out and implement the most cost-effective reductions strategies. The cost of emissions reductions achieved under a cap-and-trade program will be lower than the cost of those same emissions reductions achieved through an alternative policy instrument.

The total cost to society of meeting an emissions reduction goal is equal to the emissions mitigation costs incurred by the regulated entities plus the regulatory costs of administering and enforcing the program. Cap-and-trade programs typically involve lower regulatory costs than traditional command-and-control programs for at least two good reasons. First, there is no need for regulators to conduct detailed and time-consuming assessments and rulemakings about specific control technologies, such as establishing Best Available Control Technology measures. Second, the regulated entities have a financial incentive to demonstrate compliance because they can sell unused emissions credits.

Individual site and measure cost effectiveness: A major benefit of trading is that no *a priori* calculation of cost effectiveness by CARB will be needed because market participants will be incentivized to do this calculation internally for their unique reductions options and to then compare their internal options with the market-clearing price for emissions allowances. While the cost effectiveness of specific emission reduction strategies can be calculated as the cost of implementation divided by the amount of reductions achieved, with trading it is not clear that a specific reduction strategy will be used. This "flexible compliance strategy" makes moot the need to determine in advance which abatement methods will be best for individual facilities. Also, a cap-and-trade program eliminates the need for government agencies to estimate which strategies will be used at the facility level because the cap-and-trade program allows individual facilities (who are the ones best positioned to have that information) to weigh their options and then act in a manner that is in their best economic interest.

***Creating sector-specific cost curves*:** To determine how trading might evolve and to forecast allowance prices, we are actively researching sector-specific cost curves and will provide this information when complete.

In order to determine what the costs to facilities will be using marginal abatement curves, it is important to understand the relative differences on potential for emissions between the facilities

in each sector. One way to achieve this is through the use of benchmark emissions criteria. These benchmarks establish facility level indexes on emissions by using industry wide data. However, as explained below, benchmark criteria have not been developed for the industry.

Implementation barriers and ways to overcome them:

Variable facility characteristics create a challenge to creating marginal cost curves: It is useful to have facility-level knowledge of the marginal costs of emissions abatement. This information can be an important tool for determining emission reduction potential and likely trades between facilities (and sectors). Facility and sector-specific marginal abatement cost curves are also useful for forecasting the economy-wide costs of meeting a reductions goal.

One way to compare facilities to create the range of marginal costs curves is to use benchmark emissions criteria. These benchmarks identify the fundamental differences between stationary sources (e.g. equipment, processing dynamics, feed stock use, and product produced) that make some more emissive than others.

Reporting regulation needs to be changed to a threshold of 10,000 MTCO2: Environmental Defense believes that CARB should set a threshold of 10,000 MTCO2 (similar to proposals in Congress) for sources to be included in a multi-sector cap and trade. Because CARB's mandatory reporting regulation now includes only sources emitting greater than 25,000 MTCO2, a revision to the reporting regulation will be needed.

Overlap with natural gas utility sector: Including emissions from general combustion sources in multi-sector cap and trade program can potentially cause overlap and double-counting between the stationary sources and natural gas supply companies (e.g. utilities). As the MAC report suggests, CARB can develop a reporting and tracking system that prevents this. First, CARB could require facilities that emit greater than 10,000 MTCO2 to hold and surrender enough allowances to cover their own emissions. Second, CARB could require utilities to hold and surrender allowances equivalent to the combustion emissions form the natural gas they sell to users less that 10,000 MTCO2. This topic is covered more in depth in comments for the utility sector.

Lack of industry data: Lack of facility-level information about marginal abatement cost curves should not be seen as a barrier to implementing a cap-and-trade program. Under a multi-sector cap-and-trade system, CARB does not choose technology winners or the mitigation strategies at the facility (or for a sector). Rather, the market system allows facilities to determine the most cost effective manner to make reductions and rewards them for beating the standard. Further, under an offsets program, facilities are rewarded for the emissions reductions they can achieve beyond that required under mandatory regulations. This incentive to innovate and go beyond the regulatory mandate is one of the most attractive advantages of cap-and-trade policy over other mechanisms.

Although specific strategies to reduce emissions at stationary sources are well known, the extent to which these strategies can be implemented in the state of California is not. The primary reasons for this data gap are the large degree of variability in process equipment type, age, and configuration across the state. Further, although various programs have targeted energy efficiency and GHG reductions within the sector (e.g. US EPA Energy Star, US EPA Climate Leaders), the extent of penetration of these programs is not well characterized. However, this lack of data should not be seen as a barrier to implementation.

Costs and competitiveness: Response from general stationary combustion sources to make GHG emission reductions will likely cover a range of inspection, maintenance, and equipment upgrade / replacement programs. However, since these programs will entail both fixed and variable costs for covered facilities, requiring emissions reductions without proper safeguards may negatively affect business profitability and competitiveness. To overcome this barrier, CARB should design the market system to account for businesses that operate on fixed income streams and are unable to respond to market pressures. Further, CARB should facilitate increased access to public benefit programs that give aid to businesses for reducing GHG and energy use.

Semi-conductor coverage: Although emissions from semi-conductors currently account for 4.4% of the GHG from non-combustion sources, sectoral growth is projected to increase this quantity. The primary emissions from semi-conductors are PFCs and SF6, and each is likely to be calculated using sales (production plus imports, minus exports) as a proxy. Although such data is available within each business, CARB will need to establish a reporting and tracking mechanism to regulate these emissions and establish a metric by which the emissions reductions required from each plant are determined.

Nitric acid coverage: Emissions from nitric acid manufacturing are process type emissions not associated with combustion. Although plant specific emissions rates can be calculated based on production and sales data, CARB will need to establish a reporting and tracking mechanism to regulate this industry. Further, CARB will need to establish a metric by which the emissions reductions required from each plant are determined.

Potential impacts on criteria pollutants

Emissions from stationary combustion sources can lead to formation of nitrogen oxides and carbon monoxide. Generally, as combustion rates are decreased, the formation rate of these pollutants also decreases. Therefore, as methods to decrease GHG form combustion sources lead to energy efficiency and conservation, less combustion is needed to produce the same level of heat output, thereby leading to reduced criteria pollutants.

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